

### REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the present amendment and in light of the following discussion, is respectfully requested.

Claims 22, 24, 26-34, and 36-47 are pending in the present application. Claim 38 is amended. Support for the amendment to Claim 38 is self-evident. Thus, no new matter is added.

The present Amendment is submitted in accordance with the provisions of 37 C.F.R. § 1.116, which after Final Rejection permits entry of amendments placing the claims in better form for consideration on appeal. As the present amendment is believed to overcome outstanding rejection under 35 U.S.C. § 103(a), the present amendment places the application in better form for consideration on appeal. In addition, the present amendment is not believed to raise new issues because the changes to Claim 38 are of a minor nature. It is therefore respectfully requested that 37 C.F.R. § 1.116 be liberally construed, and that the present Amendment be entered.

The outstanding Office Action rejected Claims 22, 24, 29-34, 36-42, and 45-47 under 35 U.S.C. § 103(a) as unpatentable over Ress, Jr. et al. (U.S. Patent No. 6,190,133, hereinafter "Ress") in view of Sagel et al. (U.S. Patent No. 6,773,817, hereinafter "Sagel"); and rejected Claims 26-28 and 43-44 under 35 U.S.C. § 103(a) as unpatentable over Ress in view of Sagel and further in view of Schilling (U.S. Patent No. 5,490,764) or Bedford (GB 2242848).

Applicants respectfully traverse the rejection of Claims 22, 24, 29-34, 36-42, and 45-47 under 35 U.S.C. § 103(a) as unpatentable over Ress in view of Sagel.

Independent Claim 22 recites a blade that includes a core and a casing and amended independent Claim 38 recites a method for manufacturing a blade that includes a core and a casing. The core includes a first material that includes at least a metal matrix and the casing

includes a second material that at least includes a metal matrix. The metal matrices of the first and second materials both have aluminum as a base metal. The core and casing include a metallurgical bond between each other that results from compressing the core and the casing. The blade is manufactured from a compression step followed by a forging step.

Turning now to the cited art, Ress describes an airfoil with a core (23) and a metallic structure (22a). The outstanding Office Action asserts:

Ress teaches the blade may be subjected to a compression step to form a metallurgical bond (col. 6, lines 12-17) and also teaches that subjecting portions of the blade to processes such as forging is suitable (col. 4, lines 53-65 and col. 3, lines 30-43).<sup>1</sup>

Ress, at column 4, lines 55-60, states:

Further, the gamma titanium aluminide alloy core in the powder metal and cast form can be subjected to a wrought processing step *prior to* having the metallic structure cast therearound. A wrought processing operation includes, but is not limited herein to extruding, forging, rolling, and isothermal forging. (Emphasis added.)

In other words, these wrought processing steps, such as forging and isothermal forging, are performed on **only the core (23) and not to the entire blade comprising the core (23) and the casing (22a)**. Moreover, at column 3, lines 30-43, Ress describes forge bonding of the attachment end (22b) of the blade to the disk (19) and not the forging of the whole blade for the manufacturing thereof.

In addition, the outstanding Office Action acknowledges that Ress fails to describe an embodiment where the core and casing are aluminum based.<sup>2</sup> Instead, the outstanding Office Action relies on Sagel for the above-noted feature. The outstanding Office Action asserts:

Sagel further teaches that the core 7 may be an aluminum base metal such as Ti-Al (col. 4, lines 19-38). Sagel

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<sup>1</sup> See outstanding Office Action at page 2.

<sup>2</sup> See outstanding Office Action at page 3.

also teaches that the casing coating 6 may be formed from a base metal aluminum alloy (col. 4, lines 62-67).<sup>3</sup>

Applicants respectfully note that column 4, lines 19-38 of Sagel describes a blade produced by powder metallurgy from Ti-Al, with a wear-resistant layer (6) comprising an alloy based on Pd-Cu-Si or Ta-Si-N. In other words, no aluminum alloy is mentioned for the wear-resistant layer (6). Moreover, Sagel at column 4, lines 62-67, describes an integrally bladed rotor (10) produced from carbon fiber-reinforced plastic, with a wear-resistant layer (6) made from an Ni-W based alloy or from an alloy of Al, at least one rare earth and a transition metal. Thus, Applicants respectfully submit that Sagel fails to disclose or suggest the use of aluminum alloys for both the core and the casing of a blade.

Regarding Claim 38, the outstanding Office Action asserts:

[T]he prior art teaches compressing a core and casing which may be formed of an aluminum based material forming a metallurgical bond between the layers.<sup>4</sup>

Applicants respectfully disagree. Applicants respectfully submit that Ress and Sagel do not disclose or suggest compressing a core and casing which may be formed of an aluminum based material forming a metallurgical bond between the layers.

Accordingly, no reasonable combination of Ress and Sagel would include all of the features recited in independent Claims 22 and 38, or claims depending therefrom. The other cited references, such as Schilling and Bedford, were applied for other features recited in the dependent claims and do not provide any additional support for concluding that independent Claims 22 and 38 would have been obvious. Therefore, Applicants respectfully request the rejection of Claims 22, 24, 26-34, and 36-47 under 35 U.S.C. § 103(a) be withdrawn.

Applicants wish to make additional remarks regarding Pankratz. Applicants recognize that a forged component, such as an aluminum forged component, would not have

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<sup>3</sup> See outstanding Office Action at page 3.

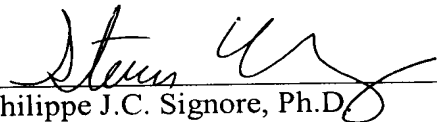
<sup>4</sup> See outstanding Office Action at page 4.

the internal imperfections which inherently result from the casting process. However, Pankratz does not disclose or suggest forging a composite structure formed with several components linked together. Nor does Pankratz disclose or suggest linking the several components together through a compression step before a forging step. Thus, Applicants respectfully submit that Pankratz would not disclose or suggest a succession of compressing and forging steps for a composite structure formed with several components.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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